

WHAT IS CLAIMED IS:

1. An endovascular fastener applicator for endoluminally fastening a prosthetic graft to a vessel with at least one fastener comprising:

a tubular body configured for positioning within a vessel;

5 an expandable portion disposed adjacent a distal end of the tubular body and being expandable to support a prosthetic in contact with an inner surface of a vessel;

10 a fastener applying head rotatably mounted on the distal end of the tubular body and movable between a load position longitudinally aligned with the tubular and a firing position oriented approximately 90° with respect to the tubular body; and

a handle assembly mounted on a proximal end of the tubular body.

2. The applicator as recited in claim 1, wherein the handle assembly has a first control to expand the expandable portion.

15 3. The applicator as recited in claim 1, wherein the handle assembly includes a second control to pivot the fastener driving head to the firing position.

4. The applicator as recited in claim 3, wherein the second control also rotates the fastener driving head about the longitudinal axis of the tubular body.

20 5. The applicator as recited in claim 3, wherein the handle assembly includes a third control to move a fastener out of the fastener driving head and into tissue.

6. The applicator as recited in claim 5, wherein the third control further moves a fastener carrying slider into engagement with tissue.

7. The applicator as recited in claim 1, wherein the fastener is a helical coil fastener.

5 8. The applicator has recited in claim 7, further comprising a storage chamber extending from a distal end of the expandable portion, the storage chamber containing at least one helical coil fastener.

9. The applicator as recited in claim 3, wherein the third control is connected to the fastener carrying slider by a wire formed of a shape memory material.

10 10. The applicator as recited in claim 1, wherein the fastener is a conventional staple.

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